



PRODUCT DEFINITION AND USERS' GUIDE

(PUG)

APPENDIX X: ISO SERIES METADATA

REVISION C.1 (Interim)
Cloud & Moisture Imagery

20 March 2014

REVISION C.1 Interim



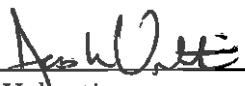
U.S. Department of Commerce (DOC)
National Oceanic and Atmospheric Administration (NOAA)
NOAA Satellite and Information Service (NESDIS)
National Aeronautics and Space Administration (NASA)

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PRODUCT DEFINITION AND USERS' GUIDE (PUG)

APPENDIX X: ISO SERIES METADATA

REVISION C.1 (Interim)
Cloud & Moisture Imagery



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NOAA
GOES-R Ground Segment Project Manager

4/3/2014
Date

ISSUE	CCR #	DATE	PAGES AFFECTED	DESCRIPTION
Original	N/A	09/27/2012	All	GSP – GSP is providing this document to the public for information purposes. CDRL SE-16 PUG Rev-B was formally accepted by the GSP in a contract letter dated September 7, 2012. In addition, government review comments will be addressed in the next delivery.
Post-CDR Interim Release – B1	N/A	01/30/2013	All	Post-CDR Interim Release Rev-B.1
Revision C	N/A	12/06/2013	All	<p>Post-CDR Interim Release PTR-9218 Delivery_SE-16_Product Definition and Users' Guide (PUG) Release Update Rev C</p> <p>1) Other than the instrument overview and the ABI Fixed Grid paragraph, paragraphs 1 through the end of paragraph 7.1.3 have been completely revised with new and updated content. A Standard Coordinate data paragraph has been added to the ABI Fixed Grid paragraph.</p> <p>2) Paragraphs 7.2 through the end of paragraph 8.4 have not been revised for this version of the PUG.</p> <p>3) New appendices for the CCSDS APIDS, and product refresh rates and latencies have been included.</p> <p>4) The subsequent version is identified where new content will be inserted into paragraphs that currently have headings and no content.</p> <p>PTR-7556 SE-16 PUG - Deferred GSP Comments from Rev. B.2 Review</p> <p>A subset of the deferred comments addressed related to the Radiances product, filename conventions, GRB content and format, and several miscellaneous topics.</p> <p>PTR-9027 SE-16 PUG - Evaluate Customer Comments Against Rev B.2</p> <p>A subset of the deferred comments addressed related to the Radiances product, filename conventions, GRB content and format, and several miscellaneous topics.</p>
C.1	N/A	March 11, 2014	Excerpt for Product	Working version.

An excerpt from:

PRODUCT DEFINITION AND USERS' GUIDE (PUG)

APPENDIX X: ISO SERIES METADATA

**REVISION C.1 (Interim)
Cloud & Moisture Imagery**

20 March 2014

Version Notes

Harris Corporation under Contract DG133E-09-CN-0094 with NOAA develops the PUG for the GOES-R Core Ground Segment Project, delivered to the Government as CDRL SE-16, Document Control Number 7035538. The most recent delivery was Revision C, delivered December 6, 2013.

This version is an excerpt of Appendix X of the current working document, marked as Revision C.1 (*interim*). It retains the following sections from the full version:

- 1.0 Introduction
- 2.0 ISO Series Metadata Overview
- 5.0 Level 2+ Product and Data ISO Series Metadata
 - 5.1 Level 2+ Products
 - 5.1.1. Cloud & Moisture Imagery
- 6.0 ISO Series Metadata Filename Conventions
 - 6.3 Level 2+ Products and Data

The excerpted document does not include information for Level 0 or Level 1b products as those sections have not been finalized yet. They will be posted in an upcoming revision to the PUG on the GOES-R website.

NON-EXPORT CONTROLLED

THESE ITEM(S) / DATA HAVE BEEN REVIEWED IN ACCORDANCE WITH THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR), 22 CFR PART 120.11, AND THE EXPORT ADMINISTRATION REGULATIONS (EAR), 15 CFR 734(3)(b)(3), AND MAY BE RELEASED WITHOUT EXPORT RESTRICTIONS.

11 March 2014

RECORD OF CHANGE

REVISION	DATE	DESCRIPTION
C	06 December 2013	Post-CDR Interim Release PTR-9218 Delivery_SE-16_Product Definition and Users' Guide (PUG) Release Update Rev C 1) Co-locate all ISO series metadata into a single document to improve usability of the PUG
<i>C.1 (interim)</i>	14 March 2014	Excerpt for Cloud & Moisture Imagery

TABLE OF CONTENTS FOR APPENDIX X

<u>Paragraph</u>	<u>Title</u>	<u>Page</u>
1.0	INTRODUCTION	1
1.1	Scope	1
2.0	ISO SERIES METADATA OVERVIEW	1
3.0	LEVEL 0 PRODUCT ISO SERIES METADATA	3
4.0	LEVEL 1B PRODUCT AND DATA ISO SERIES METADATA	3
5.0	LEVEL 2+ PRODUCT AND DATA ISO SERIES METADATA.....	3
5.1	Level 2+ Products	3
5.1.1	Cloud & Moisture Imagery	3
6.0	ISO SERIES METADATA FILENAME CONVENTIONS	14
6.1	Level 0 Products	15
6.2	Level 1b Products and Data	15
6.3	Level 2+ Products and Data	15

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
TABLE 6.0-1	COMMON FILENAME STRING FIELDS	14
TABLE 6.0-2	APPENDIX A FILENAME CONVENTION PARAGRAPHS FOR SPECIFIC ISO SERIES METADATA TYPES	14
TABLE 6.3	LEVEL 2+ ISO SERIES METADATA DSNS	15

11 March 2014

1.0 INTRODUCTION

1.1 Scope

The Product Definition and Users' Guide (PUG) document provides a product description and format users' guide for all data and products produced and made available to users by the Geostationary Operational Environmental Satellite R Series (GOES-R) Core Ground Segment (GS), developed under contract DG133E-09-CN-0094. This includes the Level 0 products, Level 1b products, GOES-R Rebroadcast (GRB), and Level 2+ products. This also includes ISO series metadata, instrument calibration data, and processing parameters and algorithm packages.

This is an appendix to the PUG containing a detailed description of the ISO series metadata.

2.0 ISO SERIES METADATA OVERVIEW

GOES-R metadata is designed to serve two purposes:

- To support long-term archive and facilitate data discovery, evaluation, retrieval, use and reuse.
- To provide supplemental information for further processing, algorithm development, diagnostic and anomaly resolution and better understanding of each dataset.

For each level 0, level 1b, and level 2+ product, ABI sample outlier data, instrument calibration data, and level 1b and level 2+ processing parameters and algorithm packages, metadata is provided in an ISO-compliant XML product series (i.e. collection) level file. This metadata is in addition to the embedded native metadata existing in the GOES-R product and data files and is used to discover, display, exploit and further process the data. The ISO series metadata contains a set of "quasi-static" metadata elements that describe a collection of instances of a product or data. Their format, content, and citations to documents and points of contact are provided. Note that a complete ISO metadata record is produced by combining the series metadata with metadata in the product and data files using the ncISO functionality available at the NOAA Data Centers.

To present ISO Series Metadata in a readable format, each ISO xml file was transformed to text using a tool provided by NOAA National Geophysical Data Center (NGDC). The deeply nested xml format is flattened and includes only the specific fields containing metadata values. This presentation format provides links to the definitions of every ISO 19115 Universal Modeling Language (UML) class object and code list via a NOAA Enterprise Data Management (EDM) web site.

For example, given the following subset of ISO Series Metadata:

acquisitionInformation: ([MI_AcquisitionInformation](#))

operation: ([MI_Operation](#))

description: The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and provides ...

If the reader hovers their mouse over ([MI_AcquisitionInformation](#)), presses Ctrl+Click and is connected to the Internet, the NOAA EDM web page for that ISO UML class will display:

11 March 2014

MI AcquisitionInformation - NOAA Environment...

page discussion view source history

MI AcquisitionInformation

MI_AcquisitionInformation

1	instrument	0..*
2	operation	0..*
3	platform	0..*
4	acquisitionPlan	0..*
5	objective	0..*
6	acquisitionRequirement	0..*

AcquisitionDetails.png

Legend
yellow: mandatory
green: conditional
blue: optional
ISO Legend

Possible Parent Elements

- ISO Acquisition Details
- Documentation Spirals#Acquisition_Information

Categories: ISO Explorer | 19115-2

Further and complete details are available on the web site by clicking keywords (such as “Operation”) on the page and subsequent pages:

MI Operation - NOAA Environmental Data Mana...

page discussion view source history

MI Operation

MI_Operation

1	description	0..1
2	citation	0..1
3	identifier	1
4	status	1
5	type	0..1
6	parentOperation	1
7	platform	0..*
8	objective	0..*
9	plan	0..1
10	significantEvent	0..*

AcquisitionDetails.png

Legend
yellow: mandatory
green: conditional
blue: optional
ISO Legend

Possible Parent Elements

Go to: Enterprise Metadata Management

11 March 2014

The filename conventions for ISO series metadata are located in paragraph 6.0, ISO Series Metadata Filename Conventions.

3.0 LEVEL 0 PRODUCT ISO SERIES METADATA

4.0 LEVEL 1B PRODUCT AND DATA ISO SERIES METADATA

5.0 LEVEL 2+ PRODUCT AND DATA ISO SERIES METADATA

5.1 Level 2+ Products

5.1.1 Cloud & Moisture Imagery

ABI L2 Cloud and Moisture Imagery ISO Series Metadata

(MI_Metadata)

fileIdentifier: 8c9e8150-3692-11e3-aa6e-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier:

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI L2 Cloud and Moisture Imagery Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2013-10-28

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-CMIP-ISO-SERIES_c2013256151334.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 10848

resolution:

Distance: 1

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

11 March 2014

dimensionSize: 10848
resolution:
 Distance: 1
cellGeometry: ([MD_CellGeometryCode](#)) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: ([MD_PixelOrientationCode](#)) upperLeft
transformationDimensionDescription: Full Disk; ABI Channels 1, 3, 5

spatialRepresentationInfo: ([MD_Georectified](#))
numberOfDimensions: 2
axisDimensionProperties: ([MD_Dimension](#))
 dimensionName: ([MD_DimensionNameTypeCode](#)) row
 dimensionSize: 3000
 resolution:
 Distance: 1
 axisDimensionProperties: ([MD_Dimension](#))
 dimensionName: ([MD_DimensionNameTypeCode](#)) column
 dimensionSize: 5000
 resolution:
 Distance: 1
 cellGeometry: ([MD_CellGeometryCode](#)) area
 transformationParameterAvailability: true
 checkPointAvailability: false
 pointInPixel: ([MD_PixelOrientationCode](#)) upperLeft
 transformationDimensionDescription: CONUS; ABI Channels 1, 3, 5

[top](#)

spatialRepresentationInfo: ([MD_Georectified](#))
numberOfDimensions: 2
axisDimensionProperties: ([MD_Dimension](#))
 dimensionName: ([MD_DimensionNameTypeCode](#)) row
 dimensionSize: 1000
 resolution:
 Distance: 1
 axisDimensionProperties: ([MD_Dimension](#))
 dimensionName: ([MD_DimensionNameTypeCode](#)) column
 dimensionSize: 1000
 resolution:
 Distance: 1
 cellGeometry: ([MD_CellGeometryCode](#)) area
 transformationParameterAvailability: true
 checkPointAvailability: false
 pointInPixel: ([MD_PixelOrientationCode](#)) upperLeft
 transformationDimensionDescription: Mesoscale; Channels 1, 3, 5

spatialRepresentationInfo: ([MD_Georectified](#))
numberOfDimensions: 2

11 March 2014

axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 21696
 resolution:
 Distance: 0.5
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 21696
 resolution:
 Distance: 0.5
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channel 2

[top](#)

spatialRepresentationInfo: (MD_Georectified)
 numberOfDimensions: 2
 axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 6000
 resolution:
 Distance: 0.5
 axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 10000
 resolution:
 Distance: 0.5
 cellGeometry: (MD_CellGeometryCode) area
 transformationParameterAvailability: true
 checkPointAvailability: false
 pointInPixel: (MD_PixelOrientationCode) upperLeft
 transformationDimensionDescription: CONUS; ABI Channels 2

[top](#)

spatialRepresentationInfo: (MD_Georectified)
 numberOfDimensions: 2
 axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 2000
 resolution:
 Distance: 0.5
 axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2000
 resolution:
 Distance: 0.5
 cellGeometry: (MD_CellGeometryCode) area
 transformationParameterAvailability: true

11 March 2014

checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; Channel 2

[top](#)

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 5424
 resolution:
 Distance: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 5424
 resolution:
 Distance: 2
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channels 4 and 6 - 16

[top](#)

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 1500
 resolution:
 Distance: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2500
 resolution:
 Distance: 2
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channels 4 and 6 - 16

[top](#)

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2

11 March 2014

axisDimensionProperties: ([MD_Dimension](#))
dimensionName: ([MD_DimensionNameTypeCode](#)) column
dimensionSize: 500
resolution:
Distance: 2
cellGeometry: ([MD_CellGeometryCode](#)) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: ([MD_PixelOrientationCode](#)) upperLeft
transformationDimensionDescription: Mesoscale; Channels 4 and 6 - 16

[top](#)

referenceSystemInfo: ([MD_ReferenceSystem](#))
referenceSystemIdentifier: ([RS_Identifier](#))
authority: ([CI_Citation](#))
title: Product Definition and Users' Guide (PUG) Volume 5A: Level 2+ Products
date: ([CI_Date](#))
date: 2012-05-07
dateType: ([CI_DateTypeCode](#)) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection
codeSpace: <http://cf-pcmdi.llnl.gov/>

[top](#)

identificationInfo: ([MD_DataIdentification](#))
citation: ([CI_Citation](#))
title: Advanced Baseline Imager (ABI) Level 2+ Cloud and Moisture Imagery Single Band Product
alternateTitle: Data short name (DSN): ABI-L2-CMIP
date:
identifier: ([MD_Identifier](#))
authority: ([CI_Citation](#))
title: Product Definition and Users Guide (PUG) Volume 5A: Level 2 Products
date: ([CI_Date](#))
date: 2013-11-28
dateType: ([CI_DateTypeCode](#)) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: ([CI_ResponsibleParty](#))
organisationName: NOAA/NESDIS: NOAA, National Environmental Satellite, Data, and Information Services
contactInfo: ([CI_Contact](#))
address: ([CI_Address](#))
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring

11 March 2014

administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: ([CI_RoleCode](#)) originator

abstract: The Cloud and Moisture Imagery Product represents ABI Earth-view imagery as “brightness values” that are scaled to support visual analysis. All 16 bands of the ABI imager are represented in the product. Imagery for bands 1 to 6 is proportional to the “reflectance factor” and supports the characterization of clouds, vegetation, snow/ice, and aerosols. Imagery for bands 7 to 16 is proportional to brightness temperature and supports the characterization of surface, cloud, water vapor, ozone, volcanic ash and dust based on thermal properties. The brightness values may be used individually with custom color tables or combined as red/green/blue color composites resulting in enhanced imagery intended to highlight environmental features of interest. The brightness value bit depth for all bands is 12 bits with the exception of band 7, which is 14 bits. A user of the imagery product would apply further enhancements to convert the product for display on a given system (e.g., on a 24-bit r/g/b display). The conversion from reflectance factor or brightness temperature to brightness values is given by the “scale_factor” and “add_offset” for each band. Additional metadata is included to document the quantities used in the conversion of radiance to reflectance factor or brightness temperature. The Cloud and Moisture Imagery Product is provided both at the native resolution of each band (i.e., 0.5, 1.0, or 2.0 km) and as a multi-band product where all bands are represented at 2.0 km resolution. For multi-band imagery, higher resolution bands are aggregated to 2.0 km. The imagery product is represented on the GOES-R Fixed Grid and is provided for Full Disk, CONUS, and Mesoscale coverage regions.

pointOfContact: ([CI_ResponsibleParty](#))

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: ([CI_Contact](#))

address: ([CI_Address](#))

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: ([CI_RoleCode](#)) originator

resourceFormat: ([MD_Format](#))

name: netCDF

version: 4

descriptiveKeywords: ([MD_Keywords](#))

keyword: ATMOSPHERE > ATMOSPHERIC RADIATION > REFLECTANCE

keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > REFLECTANCE

keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > BRIGHTNESS

TEMPERATURE

type: ([MD_KeywordTypeCode](#)) theme

thesaurusName: ([CI_Citation](#))

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: ([CI_Date](#))

date: 2012-10

dateType: ([CI_DateTypeCode](#)) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: ([CI_ResponsibleParty](#))

11 March 2014

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: toa_lambertian_equivalent_albedo_multiplied_by_cosine_solar_zenith_angle

keyword: toa_brightness_temperature

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v18

date: (CI_Date)

date: 2011-07-22

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted.

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)

distance:

Distance: .5

spatialResolution: (MD_Resolution)

distance:

Distance: 1

spatialResolution: (MD_Resolution)

distance:

Distance: 2

language: eng; USA

characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)

extent:

TimePeriod:

beginPosition: 2016-09-09

endPosition:

extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)

code: Full Disk

extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)

code: CONUS

extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)

code: Mesoscale

[top](#)

11 March 2014

contentInfo: (MI_CoverageDescription)

attributeDescription:

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: toa_lambertian_equivalent_albedo_multiplied_by_cosine_solar_zenith_angle

attributeType:

TypeName:

aName: short

descriptor: ABI Cloud and Moisture Imagery reflectance factor (channels 1 - 6)

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: toa_brightness_temperature

attributeType:

TypeName:

aName: short

descriptor: ABI Cloud and Moisture Imagery brightness temperature at top of atmosphere
(channels 7 - 16)

units:

scaleFactor:

offset:

[top](#)

contentInfo: (MI_CoverageDescription)

attributeDescription:

contentType: (MD_CoverageContentTypeCode) qualityInformation

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: status_flag

attributeType:

TypeName:

aName: short

descriptor: ABI Cloud and Moisture Imagery data quality flags: 0=good_pixel
1=conditionally_usable_pixel 2=out_of_range_pixel 3=no_value_pixel

units:

[top](#)

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: total_number_of_points (number of geolocated/not missing pixels); valid_pixel_count (number of good or conditionally usable pixels); outlier_pixel_count (number

of good quality pixels whose value is outside valid measurement range); min_reflectance_factor (minimum reflectance factor value of good or conditionally usable pixels - Channels 1 - 6); max_reflectance_factor (maximum reflectance factor value of good or conditionally usable pixels - Channels 1 - 6); mean_reflectance_factor (mean reflectance factor value of good or conditionally usable pixels - Channels 1 - 6); std_dev_reflectance_factor (standard deviation of reflectance factor values of good or conditionally usable pixels - Channels 1 - 6); min_brightness_temperature (minimum top of atmosphere brightness temperature value of good or conditionally usable pixels - Channels 7 - 16); max_brightness_temperature (maximum top of atmosphere brightness temperature value of good or conditionally usable pixels - Channels 7 - 16); mean_brightness_temperature (mean top of atmosphere brightness temperature value of good or conditionally usable pixels - Channels 7 - 16); std_dev_brightness_temperature (standard deviation of brightness temperature values of good or conditionally usable pixels - Channels 7 - 16); percent_valid_pixels (percent of pixels with data quality flag = 00 (good_pixel) or flag = 01 (conditionally_usable_pixel)); percent_out_of_range_pixels (percent of pixels with data quality flag = 10 (out_of_range_pixel)); percent_no_value_pixels (percent of pixels with data quality flag = 11 (no_value_pixel))

result:**lineage:** [\(LI_Lineage\)](#)**processStep:** [\(LE_ProcessStep\)](#)

description: Cloud and Moisture Imagery Products (CMIP) algorithms produce digital maps of clouds, moisture, and atmospheric windows, through which land and water are observed, from radiances for the visible, near-IR, and IR bands. Information will also be provided on the conversion from radiance to reflectance factor (ABI bands 1-6), with the subsequent conversion of reflectance factor to reflectance. Information will also be provided on the conversion of radiance to brightness temperature (BT) for the ABI emissive bands (bands 7-16). The output product of the CMIP algorithm can be used by the end-user to produce imagery products in terms of brightness values (BV) for display purposes.

processor: [\(CI_ResponsibleParty\)](#)

organisationName: NESDIS/OSPO at WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: [\(CI_RoleCode\)](#) processor**processor:** [\(CI_ResponsibleParty\)](#)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: [\(CI_RoleCode\)](#) processor**processor:** [\(CI_ResponsibleParty\)](#)**organisationName:** NESDIS/OSPO at RBU (Remote Backup Unit, Fairmont, WV)**role:** [\(CI_RoleCode\)](#) processor**output:** [\(LE_Source\)](#)

description: Advanced Baseline Imager (ABI) L2 Cloud and Moisture Imagery data are digital maps of clouds, moisture, and atmospheric windows, through which land and water are observed, from radiances for the visible, near-IR, and IR bands with associated per-pixel quality flag array. End-products are unique to an ABI scene (Full Disk, CONUS or Mesoscale) and ABI channel (1 - 16).

processedLevel: [\(MD_Identifier\)](#)**authority:** [\(CI_Citation\)](#)

title: Earth Science Reference Handbook – A Guide to NASA's Earth Science Program and Earth Observing Satellite Missions

date: [\(CI_Date\)](#)**date:** 2006**dateType:** [\(CI_DateTypeCode\)](#) revision**citedResponsibleParty:** [\(CI_ResponsibleParty\)](#)**organisationName:** National Aeronautics and Space Administration (NASA)

11 March 2014

contactInfo: ([CI_Contact](#))
onlineResource: ([CI_OnlineResource](#))
linkage: http://eosps0.gsfc.nasa.gov/ftp_docs/2006ReferenceHandbook.pdf
role: ([CI_RoleCode](#)) publisher
code: L2

[top](#)

metadataMaintenance: ([MD_MaintenanceInformation](#))
maintenanceAndUpdateFrequency: ([MD_MaintenanceFrequencyCode](#)) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

[top](#)

acquisitionInformation: ([MI_AcquisitionInformation](#))
operation: ([MI_Operation](#))
description: The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and provides new and improved applications and products for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum adjust maneuvers, which will allow for near-continuous instrument observations.

identifier: ([MD_Identifier](#))
authority: ([CI_Citation](#))
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:

status: ([MD_ProgressCode](#)) onGoing

parentOperation:

platform: ([MI_Platform](#))

identifier: ([MD_Identifier](#))
authority: ([CI_Citation](#))
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System will acquire and disseminate environmental data from a near-equatorial Earth orbit at geostationary altitude. This includes the Earth's surface and atmosphere, solar activity, and geosynchronous space environment. The major functions of the GOES-R System are to support the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) support terrestrial and oceanographic Data Collection Platforms (DCPs), (2) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (3) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: ([MI_Instrument](#))
identifier: ([MD_Identifier](#))
authority: ([CI_Citation](#))

11 March 2014

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI serial number

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. ABI will be able to view the Earth with 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. It will provide three times more spectral information, four times the spatial resolution, and more than five times faster temporal coverage than the current system. Forecasters will be able to use the higher resolution images to track the development of storms in their early stages. The GOES-R ABI will be used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). It is designed to observe the western hemisphere in various time intervals at 0.5, 1, and 2 km spatial resolutions in visible, near-infrared (IR), and IR wavelengths, respectively. The ABI has two main scan modes. The continuous full disk mode will provide uninterrupted scans of the full disk every 5 minutes, while the flex mode will concurrently allow full disk imagery every 15 minutes, the continental US every 5 minutes, and a mesoscale region as often as every 30 seconds. It is expected that two mesoscale regions will be scanned, resulting in a 1 minute cadence for those sectors. The ABI will be calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI will be accurate to 1K (1 σ) at 300K.

platform: (MI Platform)

identifier: (MD Identifier)

authority: (CI Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System will acquire and disseminate environmental data from a near-equatorial Earth orbit at geostationary altitude. This includes the Earth's surface and atmosphere, solar activity, and geosynchronous space environment. The major functions of the GOES-R System are to support the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) support terrestrial and oceanographic Data Collection Platforms (DCPs), (2) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (3) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI Instrument)

identifier: (MD Identifier)

authority: (CI Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI serial number

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. ABI will be able to view the Earth with 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. It will provide three times more spectral information, four times the spatial resolution, and more than five times faster temporal coverage than the current system. Forecasters will be able to use the higher resolution images to track the development of storms in their early stages. The GOES-R ABI will be used

11 March 2014

for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). It is designed to observe the western hemisphere in various time intervals at 0.5, 1, and 2 km spatial resolutions in visible, near-infrared (IR), and IR wavelengths, respectively. The ABI has two main scan modes. The continuous full disk mode will provide uninterrupted scans of the full disk every 5 minutes, while the flex mode will concurrently allow full disk imagery every 15 minutes, the continental US every 5 minutes, and a mesoscale region as often as every 30 seconds. It is expected that two mesoscale regions will be scanned, resulting in a 1 minute cadence for those sectors. The ABI will be calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI will be accurate to 1K (1 σ) at 300K.

6.0 ISO SERIES METADATA FILENAME CONVENTIONS

The main volume of the PUG contains a summary level description of the filename conventions used for all GOES-R product and data files. This appendix contains the detailed filename conventions for Level 0, 1b, and 2+ product and data ISO series metadata.

As discussed in the main volume of the PUG, filenames consist of a set of string fields delimited by an underscore or a period that are concatenated together. The content and format of several of the filename string fields are common across more than one of the ISO series metadata product and data filenames. Refer to Table 6.0-1, Common Filename String Fields.

Table 6.0-1 Common Filename String Fields

Common String Field	Description	Values and Meanings
Creation Date & Time	Date & time the file is created.	<p>“cYYYYDDHMMSS”</p> <p>Notes:</p> <ul style="list-style-type: none"> ➤ YYYY = year: e.g. 2015 ➤ DDD = day of year: 001-366 ➤ HH = UTC hour of day: 00-23 ➤ MM = minute of hour: 00-59 ➤ SS = second of minute: 00-59
Version	Version associated with the data file. Composed of a major version & minor revision number.	<p>“vVRRR”</p> <p>Notes:</p> <ul style="list-style-type: none"> ➤ VV = major version number: 01-99 ➤ RR = minor revision number: 00-99

Table 6.0-2, Appendix A Filename Convention Paragraphs for Specific ISO Series Metadata Types, identifies the subordinate paragraph where ISO series metadata are defined for GOES-R products and data. In addition, example filenames are included in the subordinate paragraphs.

Table 6.0-2 Appendix A Filename Convention Paragraphs for Specific ISO Series Metadata Types

Level 1b Product or Data Types	Appendix A Paragraph
Level 0 Products	Paragraph 6.1
Level 1b Products and Data, and GRB Information	Paragraph 6.2
Level 2+ Products and Data	Paragraph 6.3

11 March 2014

6.1 Level 0 Products

6.2 Level 1b Products and Data

6.3 Level 2+ Products and Data

Level 2+ ISO series metadata filenames are assembled using filename string fields as follows:

<DSN>__<Creation Date & Time>_Version.<File Extension>

The relationship between different ISO series metadata files and the other GOES-R Level 1b products and data files varies as a function of the type of product or data. The relationship between Level 1b product and data files is as follows:

- Each Level 2+ product is associated with a unique ISO series metadata file.
- All of the types of Level 2+ processing parameters are associated with a shared, but unique ISO series metadata file.
- All of the types of Level 2+ algorithm package files are associated with a shared, but unique ISO series metadata file.

Different ISO series metadata files have unique DSNs. Refer to Table 6.3, Level 2+ ISO Series Metadata DSNs.

Table 6.3 Level 2+ ISO Series Metadata DSNs

Type of Level 2+ Product or Data	ISO Series Metadata DSN	Specific Product
Level 2+ Product	ABI-L2-ACHA-ISO-SERIES	Cloud Top Height
	ABI-L2-ACHT-ISO-SERIES	Cloud Top Temperature
	ABI-L2-ACM-ISO-SERIES	Clear Sky Masks
	ABI-L2-ACTP-ISO-SERIES	Cloud Top Phase
	ABI-L2-ADP-ISO-SERIES	Aerosol Detection
	ABI-L2-AOD-ISO-SERIES	Aerosol Optical Depth
	ABI-L2-CMIP-ISO-SERIES	Cloud & Moisture Imagery
	ABI-L2-COD-ISO-SERIES	Cloud Optical Depth
	ABI-L2-CPS-ISO-SERIES	Cloud Particle Size Distribution
	ABI-L2-CTP-ISO-SERIES	Cloud Top Pressure
	ABI-L2-DMW-ISO-SERIES	Derived Motion Winds
	ABI-L2-DSI-ISO-SERIES	Derived Stability Indices
	ABI-L2-DSR-ISO-SERIES	Downward Shortwave Radiation: Surface
	ABI-L2-FDC-ISO-SERIES	Fire / Hot Spot Characterization
	ABI-L2-FSC-ISO-SERIES	Snow Cover
	ABI-L2-HIE-ISO-SERIES	Hurricane Intensity
	ABI-L2-LST-ISO-SERIES	Land Surface (Skin) Temperature
	ABI-L2-LVTP-ISO-SERIES	Legacy Vertical Moisture Profile
	ABI-L2-RRQPE-ISO-SERIES	Rainfall Rate/QPE
	ABI-L2-RSR-ISO-SERIES	Reflected Shortwave Radiation: TOA
	ABI-L2-SST-ISO-SERIES	Sea Surface (Skin) Temperature
	ABI-L2-TPW-ISO-SERIES	Total Precipitable Water

11 March 2014

	ABI-L2-VAA-ISO-SERIES	Volcanic Ash: Detection & Height
	GLM-L2-LCFA-ISO-SERIES	Lightning Detection
Level 2+ Processing Parameters	PARM-L2-ISO-SERIES	
Level 2+ Algorithm Packages	ALG-L2-ISO-SERIES	

The file extension for ISO series metadata files is “.xml”, indicating XML files.

The filename for the first major version, fourth minor revision to the Total Precipitable Water ISO series metadata created on January 31, 2018 at three minutes past noon is:

“ABI-L2-TPW-ISO-SERIES_c2018031120300_v0104.xml”